

EM 200-1-1  
1 Jul 94

APPENDIX D

GUIDELINES

FOR

ANALYZING AND REPORTING

PERFORMANCE EVALUATION SAMPLES

FROM

THE U.S. ARMY CORPS OF ENGINEERS

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GUIDELINES FOR ANALYZING AND REPORTING PERFORMANCE  
EVALUATION SAMPLES FROM THE U.S. CORPS OF ENGINEERS

Please read and follow these guidelines for analyzing and reporting performance evaluation samples and retain these guidelines in your file for future reference.

**GENERAL INFORMATION**

The guidelines addressed below are the general requirements for performance evaluation (PE) samples analysis and reporting. Please follow them explicitly. Sample-specific guidelines will be provided with each shipment of PE samples and shall be followed wherever applicable. The sample-specific guidelines supersede these general guidelines.

**POINTS OF CONTACT**

A Laboratory Validation Committee (hereafter referred to as the Committee) at the HTRW Mandatory Center of Expertise (MCX) of the U.S. Army Corps of Engineers (USACE) is responsible for all aspect of the USACE HTRW laboratory validation program. A Laboratory Validation Coordinator (hereafter referred to as the Coordinator) is the point of contact of the Committee. Any questions concerning the USACE HTRW laboratory validation program should be directed to the Coordinator at the following mailing address and phone number:

U.S. Army Corps of Engineers  
HTRW Mandatory Center of Expertise  
ATTN: CEMRD-ED-EC (Laboratory Validation Coordinator)  
12565 West Center Road  
Omaha, NE 68144-3869

Voice: (402) 221-7494  
FAX: (402) 221-7403

**PE SAMPLES**

Most PE samples will be sent out from the analytical laboratory of USACE Waterways Experiment Station (WES) in Vicksburg, Mississippi, except for petroleum hydrocarbons, oil and grease, and explosives which will be sent out from the USACE Missouri River Division Laboratory (MRDL) in Omaha, Nebraska. PE samples are method- and matrix-specific. A laboratory has to

pass all PE samples of different matrices available from the USACE to be considered for multimedia approval.

### ANALYTICAL METHODS

A commercial laboratory shall use contract-required analytical methods for all PE sample analyses unless otherwise instructed by the Coordinator. The contract-required analytical methods are usually specified in a project-specific Scope of Services or Chemical Data Acquisition Plan. The following analytical methods from SW-846 (1986 or the most recently promulgated version) and EPA-600/4-79-020 (revised 3/1983) are the most commonly specified methods for the respective analyses. Any changes in analytical methods from the contract-required analytical methods must be pre-approved by the Committee.

#### PARAMETERS

#### METHODS

Volatile Organic Compounds (VOA)	8240A
Halogenated Volatile Organic Compounds (HVO)	8010A
Aromatic Volatile Organic Compounds (AVO)	8020
Semivolatile Organic Compounds (BNA)	8250/8270A
Organochlorine Pesticides (PEST)	8080
Polychlorinated Biphenyls (PCB)	8080
Phenols (PHENO)	8040A
Chlorinated Herbicides (HERB)	8150A
Polynuclear Aromatic Hydrocarbons (PAH)	8100/8310
Nitroaromatics and Nitramines (EXPLO)	8330 (draft)
Total Recoverable Petroleum Hydrocarbons (TRPH)	418.1
Total Recoverable Oil and Grease (O&G)	413.1/413.2
Total Petroleum Hydrocarbons (TPH)	8015 (mod.)
Trace Metals (METAL)	6010A
Arsenic	7060/7061
Mercury	7470/7471
Selenium	7740/7741
Cyanide (CN)	9010A/9012
Total Organic Carbon (TOC)	9060
Common Anions (ANION)	300.0/300s
Phenolics (PHENL)	9065/9066/ 9067

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PARAMETERS

METHODS

Total Hardness (HARD)	130s
Alkalinity (ALKAL)	310s
Chemical Oxygen Demand (COD)	410s
Total Dissolved Solids (TDS)	160.1
Total Suspended Solids (TSS)	160.2

ANALYSIS OF PE SAMPLES

A laboratory must use project-required analytical methods for analyses of all project-specific PE samples unless otherwise instructed by the Coordinator. A laboratory's practical quantitation limits for each analytical method must meet or be lower than those specified in the method. The soil/sediment PE samples could be real world environmental samples which contain certain analytes of high concentrations. Special attention is needed to reduce or correct the interference caused by the analytes of high concentrations. Subcontract of PE sample analysis is prohibited.

INTERNAL QC ANALYSES

A laboratory shall conduct and report all method-required internal QC analyses. The minimum internal QC analyses required for PE samples include:

- method blanks for all PE sample analyses,
- surrogate spikes for all organic PE sample analyses,
- laboratory control samples (LCSs), second column confirmation, etc., whenever applicable,
- replicates, matrix spikes, and matrix spike duplicates for all soil/sediment PE sample analyses, and
- replicates, matrix spikes, and matrix spike duplicates on spiked reagent water for all water PE samples.

DATA REPORTING PACKAGE

A laboratory may use its standard data package to report PE sample results, however, the data package should be sequentially numbered and contain as a minimum the following information:

- a. Table of contents
- b. A case narrative including a list of PE samples analyzed/reported and problems encountered with PE sample analysis.
- c. A Chain-of-Custody report.
- d. Sample preparation information including sample preparation date, method citations for sample digestion, extraction, solvent exchange, concentration, cleanup, etc.
- e. Analytical results for all target analytes plus method citations and laboratory practical quantitation limits.
- f. Summary of method-specific QC results and assessments of precision and accuracy.
- g. Phone conversation records on major issues related to PE sample analysis.

The analysis results shall identify and quantify all target analytes listed in the required analytical method, including estimated values and the quantitation limits for target analytes not detected. Except for petroleum hydrocarbons PE samples, all soil/sediment PE sample analyses shall be reported on a dry-weight basis along with percent moisture. For petroleum hydrocarbons PE samples, the results shall be reported on an "as-received" basis, i.e., no correction should be made for moisture content. Neither should any data be corrected for spike recoveries nor for any contamination found in trip blank or laboratory's method blank. Raw data including sample preparation and run log, calibration, chromatograms, calculation, etc., are normally not required for PE sample data package unless requested by the Coordinator.

#### **WHEN TO REPORT**

Normally, written reports for all PE sample analyses are to be received by the sample originators at WES and/or MRDL within 20 working days after receipt of the samples. For fast turnaround projects or reanalysis of additional PE samples, a laboratory shall return the results within five or ten working days, depending on the number of PE samples to be analyzed. Failure to analyze these samples successfully or within the required time frame may result in termination of the validation process. It is a laboratory's responsibility to keep the

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Committee informed of any problems with PE sample analyses that would affect return of the results in a required time frame.

#### **WHERE TO REPORT**

All PE sample results except for total recoverable petroleum hydrocarbons, total petroleum hydrocarbons, total recoverable oil and grease, and explosives shall be returned to WES:

U.S. Army Corps of Engineers  
Waterways Experiment Station  
ATTN: CEWES-EE-C (Ann B. Strong)  
3909 Halls Ferry Road  
Vicksburg, MS 39180-6199

The PE sample results for total recoverable petroleum hydrocarbons, total petroleum hydrocarbons, total recoverable oil and grease, and explosives shall be returned to MRDL:

U.S. Army Corps of Engineers  
Missouri River Division Laboratory  
ATTN: CEMRD-ED-L (Doug Taggart)  
420 S. 18th Street  
Omaha, NE 68102-2586

A complete copy of all PE sample results shall be sent to the Committee:

U.S. Army Corps of Engineers  
HTRW Mandatory Center of Expertise  
ATTN: CEMRD-ED-EC (Laboratory Validation Coordinator)  
12565 West Center Road  
Omaha, NE 68144-3869

#### **CRITERIA FOR EVALUATION OF PE SAMPLE RESULTS**

The laboratory PE sample results will be compared in the following manner: (1) with the prepared concentrations of PE samples that are used as the absolute recovery comparators, and (2) with the statistical mean and standard deviations reported by a group of referee and/or peer laboratories. The acceptable limits for analyte quantitation will be established statistically at 95 percent confidence based on peer group results. If only minor errors which are attributable to data calculation, transcription, etc. appear in PE samples analysis, a laboratory will have an opportunity to provide revised data. If a

laboratory is asked to check its analytical data, the laboratory should return revised data within five working days.

#### **WHAT IS NEXT AFTER PE SAMPLE ANALYSIS?**

Possibly an on-site laboratory inspection. After data revisions, a commercial laboratory must pass, as a minimum, more than 50 percent of all PE samples, including project-specific and non-project-specific PE samples, within 40 working days from receipt of the first set of PE samples to trigger the on-site laboratory inspection process. Prior to an inspection, a laboratory shall promptly submit to the Coordinator a concise report about the problems, solutions, and corrective actions on the PE sample parameters failed on its first attempt. After receipt of this report, the Coordinator will contact the laboratory to schedule an on-site inspection within two weeks.

During an on-site laboratory inspection, the USACE inspectors will investigate the problems and solutions for the failed PE samples. Additional PE samples may be required, as recommended by the inspectors and concurred by the Committee, for a laboratory to demonstrate that all problems associated with the failed parameters have been satisfactorily corrected. If additional PE samples are analyzed, a laboratory shall return analytical results of the additional PE samples within five or ten working days after receipt of the PE samples depending on the number and type of the additional PE samples. The cost of additional PE samples will be borne by the laboratory (currently about \$100 to \$300 per method, per matrix, and per shipment.)